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Comments of the Sierra Club and Natural Resources Defense Council
On Washington's Revised Proposal for the Emissions Performance Standard Update

I. Introduction

The Sierra Club and the Natural Resources Defense Council ("NRDC") submit the following comments to the Washington Department of Commerce ("Commerce") addressing the Draft Revised Survey of Combined Cycle Combustion Turbine Greenhouse Gas Emission Rate ("Revised Survey") issued on January 17, 2013. Sierra Club and NRDC submitted a previous round of comments on December 3, 2012 ("December Comments") addressing Commerce's first draft survey.

Sierra Club and NRDC appreciate the responsiveness of Commerce to several of the issues raised in our December Comments. In particular, we commend Commerce for removing several smaller units from the Revised Survey. As noted in our December Comments, the first survey overrepresented smaller, inefficient units. This over-inclusion of smaller units resulted in an overall Emission Performance Standard ("EPS") that was skewed toward a higher emission rate. Commerce also removed the relatively efficient 660 MW Alstom KA24-2 unit. By removing some – though not all – of the smaller units and the Alstom unit, Commerce lowered the Revised Survey average from 980 lb/MWh to 970 lb/MWh.

While changes to the Revised Survey are a slight improvement, they did not correct the deficiencies in the survey that our December Comments identified. First, Commerce failed to address the overly generous adjustment factors that it applied to the surveyed units. Second, Commerce inconsistently applied its own test that a unit must have been purchased and either installed or in the

process of installation in order to be included in the Revised Survey. Third, Commerce did not go far enough to resolve the over-representation of small units in the survey.

II. EXCESSIVE ADJUSTMENT FACTORS

Our December Comments noted that Commerce's cumulative 21.5 percent adjustment factors were far too high.[1] We previously commented that a comparison of the "new and clean" emission factors with the measured in-service performance of existing Washington State CCCTs demonstrates that the proposed adjustment factors overstate the annual GHG emission rate by approximately 8.4 percent. We submit that the measured emission performance is far more accurate than the speculative, undocumented arguments that are employed to support the adjustment factors used in the Revised Survey.

The "clean and new" emissions performance of the existing Washington units (excluding 2 outliers) is 810 lb/MWh, very close to the 798 lb/MWh average for the designs in the Revised Survey. The measured 2010 emission rate for those units is 866 lb/MWh. This suggests that the appropriate correction is 866/810 (1.069) or 6.9 percent. These data also suggest that the most accurate estimate of the average EPS for new units should be less than 866 lb/MWh. Since the measured average emission rate for "*old*" CCCTs is 866 lb/MWh, the proposed rate of 970 lb/MWh for "*new*" units is clearly too high. While some allowance for year-over-year variation might be appropriate, nothing in the record supports the dramatically higher EPS of 970 lb/MWh that results from applying an adjustment factor of 21.5 percent. As explained in our December Comments, Sierra Club and NRDC recommend applying an adjustment factor of 10 percent.[2] In the alternative, Commerce may also look to EPA's recently employed adjustment factor of 13 percent to convert GTW published new and clean performance data to reflect in-use performance.

Commerce did not fully address our prior comments with respect to the errors in calculating the adjustment factors. While we disagree with Commerce's conclusions, response to comments #SV-23 addressed our recommendation to remove the two percent gross-to-net adjustment and #SV-24 addressed our recommendation to include positive adjustment factors. However, Commerce did not address our comments regarding the adjustment factor applied for duct burning. In particular, Commerce misapplied the results of surveys of duct burner usage. The agency adjusted the heat rate of each configuration to reflect 15 percent of additional capacity from full duct firing at 37.5 percent of operational hours, or 2,464 annual hours. However, the survey results did not report that existing units employed **full** duct firing for 37.5 percent of operational hours, merely that they employed **some** duct firing 33 percent of the time.[3] As noted in our December Comments, this dramatic over-compensation for duct burning accounts for a significant portion of the discrepancy between Commerce's use of an overall 21.5 percent adjustment factor and the more reasonable adjustment factor of 10 percent that we have recommended or the 13 percent adjustment factor that EPA has used. Finally, we note that the actual emissions associated with any duct burning that was employed by Washington State CCCTs is included in the measured emission data, which as we discussed above resulted in a total adjustment of only a 6.9 percent increase over new clean and new emissions performance.

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[1] Sierra Club-NRDC December 3 Comments, pp 8-12.

[2] Sierra Club-NRDC December 3 Comments, p. 9.

[3] We note that a survey result of 14.1 percent does not "round" to 15 percent and that a survey result of 33 percent of operational hours does not justify an adjustment factor employing 37.5 percent.

The agency has explained its decision to apply an overly generous adjustment factor by noting that sources must comply with the applicable limit annually; therefore, Commerce contends that what it describes as a "lenient" limit is warranted. However, there has been no showing that such a large compliance margin is required where the compliance obligation is an annual average. The annual average mitigates short term variability that could result from unusual operating circumstances. In addition, the statute itself provides the measure of leniency that the legislature intended because the EPS is to be based on the average emission rate of new units, not the lowest emission rate achieved.

III. "NEW" MEANS "NEW"

In our December Comments, we recommended that Commerce include only turbine designs from the 2007-2012 time period.[4] Commerce agreed with our comments that older and smaller designs were overrepresented in the first survey, and in response Commerce removed models GE S107EA, GE 106FA, Mitsubishi MPCP(501F) and Siemens SCC6-2000E. This change is an overall improvement, but Commerce continues to include CCCT designs that predate 2007 while excluding newer designs. As demonstrated in our earlier comment, the state mandates that the survey focus on new CCCT designs. The fact that some older designs continue to be offered for sale is irrelevant. Had the legislature intended to include such sales it would simply have required that the survey include all sales of new units, rather than the design-focused approach adopted by the language in RCW 80.80.050 requiring Commerce to survey "**new** combined cycle natural gas thermal electric generation turbines commercially available and offered for sale by manufacturers and purchased in the United States…" (emphasis added)

The Revised Survey is an improvement over the earlier version, but still only 5 of the 13 designs evaluated are "new" designs introduced in the last 5 years. The preponderance of older, less efficient designs is compounded by the exclusion of several new designs that have been offered for sale and sold in the United States. Commerce articulated its survey methodology in response to comments #SV-15: "The rule that Commerce applied is that to be included in the Survey a CCCT had to be listed in the GTW Handbook and had to have been purchased by a utility and be either installed or in the process of being installed in the U.S. during 2007 – 12 (July 2012)." Yet Commerce deviates from its own rule and excludes new units by shortening the cutoff date for new units to be considered in its survey to those that were ordered by 2010.[5] It is now 2013 and there is no justification to exclude sales in the last two years of a 5 year review, particularly where new data from the 2012 GTW Handbook has been available for months and was referenced in comments during this rulemaking process. In some instances, the agency justifies excluding information concerning new units on the basis that the information was received after the initial proposal.[6] Commerce may not establish an arbitrary cutoff date that excludes new units that otherwise fit within the definition of RCW 80.80.050. Rather, Commerce is required to incorporate all data and information in its determination that is received prior to the closure of the comment period. Otherwise, commenting on the proposal would be a meaningless exercise.

Commerce's exclusion of newer designs effectively adds two new tests to the statute's definition of units to be included in the survey – (1) the design must have been sold in 2005 - 2010 and (2) the design must have been manufactured and delivered prior to an arbitrary mid-2012 cutoff date for the survey. These tests are not found in the underlying legislation and are inconsistent with the legislative language that establishes the applicable test: "new combined-cycle natural gas thermal

[4] Sierra Club-NRDC December 3 Comments, p. 3.
[5] Revised Survey, p. 14.
[6] *See, e.g.,* Response to Comments #SV-17 and #SV-18.

electric generation turbines commercially available and offered for sale by manufacturers and purchased in the United States." Commerce employs its more restrictive tests to exclude the most efficient new CCGTs in the world: the Mitsubishi J series, the Mitsubishi 501GAC and the GE 7FA.05. Commerce acknowledges sales of each of these designs,[7] but Commerce asserts that none of these state-of the art units have yet been delivered. However, this assertion is simply incorrect with respect to the Mitsubishi 501GAC. Our December Comments noted contracts for the purchase of these models occurred as early as 2010.[8] We further note here that Dominion Corporation, the owner of Virginia's Warren County power station that has purchased three these units, reports that construction of the Warren County power station began in March 2012, and as of January 31, 2013 all major components had been received and two of the three turbines had been installed.[9] These units would therefore meet even Commerce's more restrictive rule that designs must be "installed or in the process of being installed" by July 2012. Commerce's continued exclusion of the Mitsubishi 501GAC is inconsistent with its own rule for determining the makeup of the Revised Survey, and the final survey should include the design.

With respect to the Mitsubishi J series and the GE 7FA.05, we are not aware of any information that contradicts Commerce's assertion that the Mitsubishi J series and the GE7FA.05 have not yet been installed. Nevertheless, Commerce still cannot support the imposition of this more restrictive requirement that these units must be "installed or partially installed" in order to meet the RCW 80.80.050 definition to include in the survey a new CCCT unit that is "commercially available and offered for sale by manufacturers and purchased in the United States." These new designs are commercially available and have been offered for sale (and purchased) in the United States. We therefore believe that Commerce should also include these designs in the final survey.

IV. HIGH EMITTING UNITS CONTINUE TO BE OVER-REPRESENTED IN THE SURVEY

We note, and appreciate, that Commerce has acted to reduce the number of old or small, high-emitting designs that are included in the survey. However, the survey continues to include too many designs that are not representative of new baseload combined cycle natural gas generation. In the revised survey, only 5 of the 13 designs (38 percent) considered are new designs introduced in the last 5 years. Additionally, 6 of the 13 designs (46 percent) are relatively small (<300 MW) units that have higher emission rates than larger units and are not sold in meaningful numbers.[10] Small (<300MW) designs are not representative of existing baseload CCCT purchases, and there is no reason to believe that these units are representative of the new designs that will be sold as baseload units in the coming years. The Revised Survey includes the emission rates from small (<300MW) designs at 46 percent of the total survey– far higher than any likely sales of such units for baseload applications. The Revised Survey therefore continues to skew the results to a much higher average EPS than what is representative of the currently available baseload generation units. Commerce should remedy this error

[7] Response to Comments #SV-18. Commerce acknowledges that "down payments" have been made for delivery of Mitsubishi J Series and GE 7FA.05 units

[8] Sierra Club-NRDC Comments December 3, fn. 15. These units were sold in 2010. http://www.lngworldnews.com/usa-mhi-gets-order-for-three-gas-turbines-from-vepco/

[9] http://uk.reuters.com/article/2013/01/31/utilities-dominion-virginia-idUKL1N0B09WB20130131.

[10] In our December Comments we noted that that a reputable survey had determined that only 1.4 percent of 14,375MW new capacity in the PJM service area was provided by units smaller than 300 MW.

by either removing additional small units or by adding larger units, such as those discussed above, to the Revised Survey.

Two of these small capacity units (GE MB6000PF Sprint and SCC-700) are aero derivative units. Aero derivative units employ turbines derived from aircraft turbine design. These units are rarely employed for baseload applications. Commerce acknowledges that past sales of such CCCT units represented only 3 percent of **overall** CCCT sales (including all applications).[11] However, including aero units as 2 out of 13 units surveyed equates to 15 percent. This overrepresentation grossly inflates the actual use of those units in the United States. Further, we have reviewed the listing of new unit sales in the relevant issues of the GTW Handbook and find no indication that there have been any sales of new CCCTs based on the Siemens SCC-700 aero-derivative design in the last 5 years.[12] Commerce should therefore remove this design from the survey. We note that Commerce removed the 660 MW Alstom KA24-2 on the grounds that the unit has not been installed in the United States within the last five years. If Commerce removes this more efficient unit for that reason, then it should also remove the smaller and much less efficient SCC-700 unit for the same reason.

Commerce also included the GE LM6000PF aero unit. As stated above, including two aero units in the survey of 13 total (15 percent) is far too many because aero derivative turbines only make up 3 percent of recent CCCT purchases. Commerce further compounds this error by adjusting the heat rate for the GE LM6000PF to include the low NOx version of the unit.[13] To our knowledge, the only recent installation of a LM 6000PF CCCT in the United States is a single plant in Alaska. The design that was installed in Alaska was a "standard" design that does not have NOx controls. Transalta commented that GE offers a Low NOx design with NOx controls, and in response Commerce proposed to use the heat rate of the Low NOx model in lieu of the model that has been sold in the United States. The LM6000PF design should not be included in the survey at all because it is a small, 44 MW aero-derivative unit that is not representative of what would be installed in the lower 48 states. However, if Commerce insists on including the LM6000PF, then it should include the "standard" version of the unit. The Low NOx version suggested by Transalta has not, to our knowledge, been sold in the United States. Further, Commerce's adjustment factors include a system loss adjustment to account for, *inter alia*, inlet and exhaust pressure drops[14] and emission control system losses. Therefore the adjustment factor should already account for any compliance headroom that would be affected by installing NOx controls. Accordingly, the proposed substitution double counts the impact of NOx controls on the emission rate of this unit. Commerce should remove the unit from the Revised Survey, or, at a minimum, use the "standard" version of the unit.

V. SUMMARY AND RECOMMENDATION

Under RCW 80.80.050, Commerce must conduct a "survey of new combined cycle natural gas thermal electric generation turbines commercially available and offered for sale by manufacturers and purchased in the United States" and base the revised EPS on "the average emissions of greenhouse gas for these turbines." Updating the EPS is lawful and appropriate under RCW 80.80.050. However, the

[11] Response to Comments #SV-14.
[12] The GTW listing of new orders covers the period from January, 2004 to December, 2010. A search employing variants of the term "Siemens SCC-700 sales yielded no results. The Commerce definition of "purchased" requires that a unit have been purchased in the period from 2005-2010.
[13] Response to Comments, #SV-13.
[14] NOx control systems typically affect exhaust pressure.

Revised Survey issued by Commerce for public comment is still too lenient because of a number of deficiencies.

As noted above, the adjustment factors relied on by Commerce are too high. For those designs where units have been constructed and their GHG emission rates have been measured, those measured emission rates should be used rather than attempting to extrapolate from GTW data. For designs that are so new that real world emissions data is not yet available, comparing the "new and clean" emission rate of existing well-performing Washington baseload CCCTs with the measured emission rates of those units yields a far more accurate and objective adjustment factor to apply to the GTW Handbook data than the unsupported and much higher adjustment factor used by Commerce.

The Revised Survey does not include all new and efficient designs. The number of new combined cycle gas turbine designs purchased in the United States for baseload applications in the last 5 years is not so large as to preclude Commerce from identifying all such designs and computing the average emission rate for these units. The GTW Handbook provides a reasonable starting point for such a review and the number of vendors of baseload CCCTs is small. Commerce should therefore include these designs in the survey. However, if Commerce elects not to include all of the relevant designs, as it has done in the Revised Survey, then it must be able to demonstrate that the subset of designs it chooses to include in the Revised Survey is representative of the larger group that is commercially available and offered for sale and purchased in the United States. As we noted in our December Comments, a review of PJM survey data identifies four or five design series that dominate the new sales in the baseload generation market.[15] The subset of designs Commerce chooses from the GTW Handbook data review should be limited to those dominant design series where new designs have been offered for sale in the U.S. market since the adoption of the EPS.

To date, Commerce has acknowledged that small capacity designs are overrepresented in the survey, but the agency has not provided an argument as to why it may employ such a biased sample, nor has the agency provided a rationale for its inconsistent selection of the designs included in the Revised Survey. As set out above and in our December Comments, hard facts demonstrate that the selection of designs is not representative of the universe of new combined cycle turbines, and therefore the calculation of the "average" emissions of these units is incorrect.

[15] Sierra Club-NRDC December 3 Comment, p.12.

In closing, we note that with the sale of the Ferndale plant, the impact of a far more stringent EPS that more faithfully complies with the statute would not have EPS compliance implications on existing facilities.

Respectfully submitted,

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